Oxyfluorfen Summary

January 11, 2002

Uses

- Oxyfluorfen is a herbicide registered for use on a wide variety of tree and vine crops, annual and perennial crops, and non-crop areas (e.g. roadsides, residential areas).

- Oxyfluorfen is mainly applied using ground equipment, but some labels permit aerial application or chemigation for select crops. With the exception of bulb vegetables and conifers, which have more tolerance to oxyfluorfen, over the top applications are not recommended.

- Total annual domestic usage of oxyfluorfen is approximately 761,000 lbs a.i. for about 1,167,000 acres treated. Oxyfluorfen usage has increased significantly over the last several years.

Health Effects

- Oxyfluorfen is of low acute toxicity. No adverse effects reflecting a single dose were identified; therefore, an acute risk assessment is not necessary. Both subchronic and chronic studies indicate that oxyfluorfen inhibits heme production. Heme is the part of the hemoglobin molecule that contains iron and binds oxygen. Deranged production of heme produces a variety of anemias; however, the observed anemia was generally mild. Mild liver and renal toxicity also occurred. Oxyfluorfen is classified as a category C (quantified), possible human carcinogen based upon combined hepatocellular adenomas/carcinomas in the mouse carcinogenicity study.

Risks

Dietary (food) risks

- Both the chronic and cancer dietary risks from food are not of concern

Dietary (drinking water) risks

- Risks from oxyfluorfen in ground water are not of concern. Chronic risks from surface water are also not of concern.

- Cancer risk from potential concentrations of oxyfluorfen in surface water may be of concern based upon screening-level modeling.

Residential risks

- Both cancer and non-cancer risks are below EPA's level of concern.

Aggregate risks

- Aggregate chronic and short-term risks are not of concern.

- Aggregate cancer risk from food, drinking water and residential exposure exceeds the Agency's level of concern. The cancer DWLOC is zero because when aggregated, the lifetime risk from food and residential exposure alone is marginally above EPA's level of concern.

Occupational Risks

- Non-cancer risk to mixers/loaders/applicators is not of concern with the addition of chemical-resistant gloves.

- Cancer risk to mixers/loaders/applicators is below 1.0×10^{-4} with single layer PPE and generally between 1.0×10^{-5} and 1.0×10^{-6} with engineering controls.

- Postapplication non-cancer risk to workers is not of concern as long as the current 24-hour REI is observed, except for Christmas tree shearing, which may be of concern for up to 10 days.

- The cancer risks for commercial re-entry workers working with bulb vegetables is less than 1.0×10^{-4} on day zero and declines to less than 1.0×10^{-6} in 23 to 38 days. The cancer risks for commercial re-entry workers working with conifer trees and seedlings is less than 1.0×10^{-4} in 4 to 14 days. Risks decline to less than 1.0×10^{-6} in 41 to 58 days.

Ecological Risks

- There may be concern for chronic risks to birds when oxyfluorfen is applied to crops at application rates $ 0.5 lbs ai/acre/acre.

- Chronic risks to mammals may be of concern when oxyfluorfen is applied to crops at application rates $ 2.0 lbs ai/acre/acre.

- Acute and chronic risks to fish are not of concern. Acute risk to freshwater and estuarine invertebrates may be of concern from application to citrus.

- EPA has concern for risk to non-target terrestrial and aquatic plants from spray drift and run-off.

How the Risk Picture May Change

- Dow has recently submitted an aquatic invertebrate life cycle study and an aquatic plant toxicity

study. Additional changes and refinements to the risk assessment may occur after consideration of the public comments.